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## Groundwater interception trench to be installed in Clinton

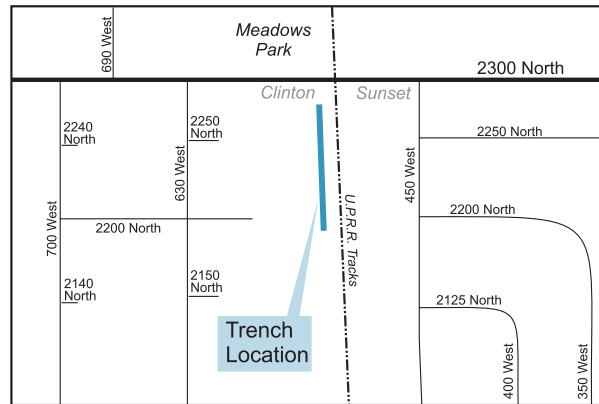
This summer, the Air Force will begin construction of a groundwater interception trench just west of the Union Pacific Railroad tracks in Clinton.

The purpose of the trench is to slow the flow of contaminated groundwater moving west into Clinton. It is the final phase of an Engineering Evaluation/Cost Analysis (EE/CA) project, which began originally with the installation of an underground treatment system along Main Street in Sunset back in 1995.

This phase will likely be the last early cleanup action taken in Sunset or Clinton before a final remedy is proposed in 2003. Like the other early actions taken, this system will probably be integrated into the final cleanup plan.

According to Mark Loucks, the project manager at Operable Unit 5, the purpose of the trench is to intercept and remove contaminated groundwater moving into Clinton.

The trench is designed to capture the water with the highest concentrations of contaminants. While the area of contamination already extends west of the trench location, concentrations in that area are lower. Once the trench is operational, those concentrations will begin to slowly reduce, Loucks said.



### The trench

The EE/CA calls for the installation of a groundwater collection trench approximately 600 feet long and between 25 and 35 feet deep. The trench will be filled with gravel, which will allow water to flow easily to the bottom of the trench. A slotted pipe installed at the bottom of the trench will collect the water and carry it to a sump. The water will be pumped out of the sump and piped to the North Davis Sewer District for treatment.

All this will occur underground and out of site. The only visible evidence of the treatment system will be the control building that will house valves and other equipment needed to operate the system.

This building will be similar in appearance to homes in the area

Construction is scheduled to begin this summer and should be completed sometime in the fall. System testing will follow the construction. The system is scheduled to be operational by the end of December, 2002.

Once construction is underway, the Air Force will be offering tours to interested citizens. Those interested in attending a tour of the construction site should contact Charles Freeman at (801) 775-6951 for more information.

### Contaminant of concern

The primary contaminant of concern at OU5 is trichloroethene (TCE). This is a common industrial degreasing solvent. The railroad maintenance facility on the west side of the base used TCE to clean locomotive parts. The waste was disposed of in an area north of the facility. This is the primary source of TCE contamination in Sunset and Clinton.

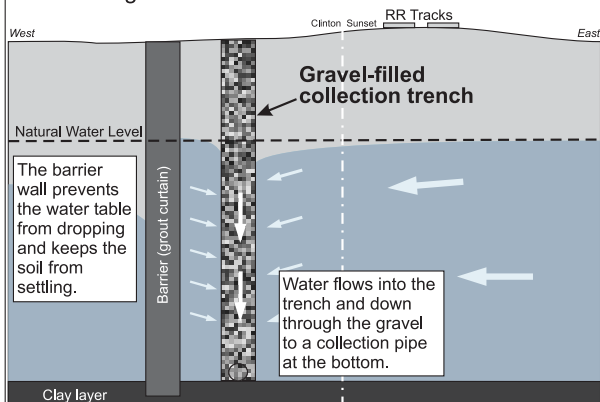
### Drinking water safe

Your drinking water is safe. The contaminated water is in the shallow aquifer, which is not a drinking water source. Your drinking water comes from reservoirs in the mountains or from deeper, uncontaminated underground aquifers.

### Two plumes at OU5

There are two areas of groundwater contamination at OU5. This system addresses contamination in the southern plume. This plume has the highest concentrations of TCE. The northern plume has lower concentrations of TCE and the contamination is not as close to the surface. Therefore, no early cleanup actions will be taken on this plume.

### Groundwater Collection Trench with down-gradient control



## Remedial Investigation

The Baseline Risk Assessment is completed as part of the Remedial Investigation Report. The RI is a comprehensive study of the contamination and is the culmination of a massive data-gathering effort.

## Hazard Index

In addition to determining the cancer risks, the Baseline Risk Assessment also calculates the risk for illnesses other than cancer. Anything less than 1.0 is considered safe. All current exposure scenarios at OU8 had a hazard index of less than 1.0.

## Excess cancer risk

An excess cancer risk of one in one million means that in a million people, scientists would expect to see one extra case of cancer above the normal rate of cancer (one in three).

## Exponential expressions

Scientists sometimes forget that most of people aren't mathematicians. So here are the exponential expressions sometimes referenced in technical reports in everyday language:

$1 \times 10^{-6}$  = 1 in 1 million  
 $1 \times 10^{-5}$  = 1 in 100,000  
 $1 \times 10^{-4}$  = 1 in 10,000  
 $3 \times 10^{-4}$  = 3 in 10,000  
 $2.8 \times 10^{-6}$  = 2.8 in 1 million or 28 in 100,000.

# Report: Groundwater contamination poses no risk to Layton residents

The Air Force recently released the report that examines and determines the risks posed by environmental contamination in areas of Layton south of Hill AFB.

The Baseline Risk Assessment for Operable Unit 8 was released October 8. This document, written by toxicologists and reviewed by the Environmental Protection Agency and the Utah Department of Environmental Quality, contains a thorough analysis of the data obtained during the Remedial Investigation and determines if people or the environment are at risk from the contamination.

The report is available for review at the Weber State University Library in Ogden. You may also view a copy of the Executive Summary of the report online at <http://www.em.hill.af.mil/restoration/documents/OU8RI/execsummary.html>.

According to the report, the contamination does not pose a current threat to people or the environment.

## Determining risk

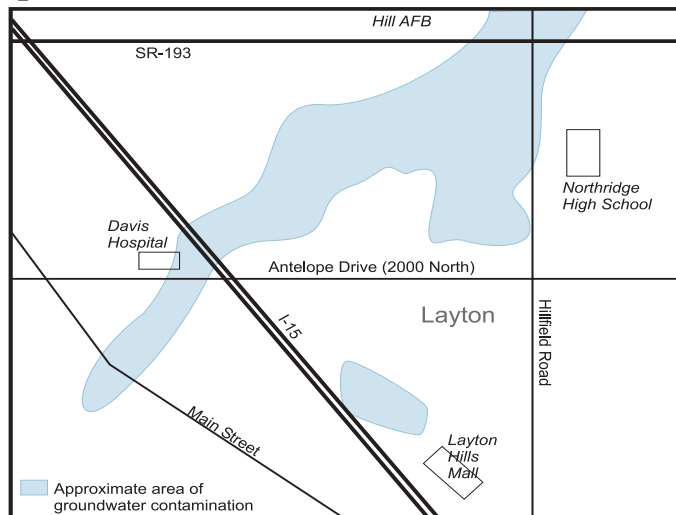
Toxicologists looked at the results of groundwater, soil and air sampling taken in the area of contamination both on and off base. Those results were used to calculate the chances someone could become ill because of the contamination.

Since contaminants from Hill AFB are not in the drinking water supply, scientists had to look at less obvious ways people could be exposed. This included breathing chemical vapors in the air, playing in contaminated water and incidental swallowing of contaminated soil or water.

According to the report, there simply is not enough contamination in the groundwater to cause a risk to anyone today.

However, the report did say a risk could exist if the groundwater were ever used as a drinking water source in the future.

The report reinforces the findings of a small-scale risk assessment conducted last year for a spring and wetland area near the Willow Bend subdivision, west of Northridge High School. The water coming from the spring was found to have low levels of trichloroethene (TCE), a degreasing solvent once used at Hill



AFB. The risk assessment, which was also reviewed by state and federal regulators, found no risk to people, even children, who may come into contact with the water.

## Public involvement

Hill's Restoration Advisory Board was consulted providing the community's perspective to the direction of the investigation. Several months before the draft Remedial Investigation Report was submitted to state and federal regulators, the Air Force invited RAB members to participate in technical presentations about the investigation and voice any concerns they had about the direction of the investigation.

"We've learned from past experience getting public input early in the process helps us match the technical and engineering requirements of the cleanup plan we will eventually propose with what the public wants," said Bob Elliott, chief of environmental restoration at Hill. "It also saves both money and time in the long run."

## Cleanup marches on

Engineers will now focus on the Feasibility Study, which evaluates the effectiveness of potential cleanup methods. At the conclusion of the FS, the Air Force will propose a plan to clean up the contamination both on and off base. The public will be invited to review the proposal and provide input before cleanup plans are finalized. The Proposed Plan is scheduled to be completed late next year.

# CleanUpdate

Cleanup news from the communities surrounding Hill AFB.

## EM gets new acting director

Dr. William R. (Bob) James has been named Acting Director of Environmental Management, replacing Allan Dalpias, who has taken another management position on base.

Dr. James has been involved in environmental issues at Hill since 1986. He has managed Hill's cleanup program, and most recently, environmental plans and programs.

In addition to his other duties, Dr. James will serve as the Air Force co-chair on the Restoration Advisory Board.

## Edible Plant Study scaled back

The Edible Plant Study planned for this year has been modified and will not be as comprehensive as originally planned.

According to project manager Kyle Gorder, the change is primarily due to concerns about how the fruit samples were to be analyzed.

Since no EPA-approved method for analyzing fruit exists, Utah State University will work this year to develop a reliable method for testing fruit, vegetables and other plants.

"For a study to be truly scientific, there must be a reliable and repeatable method for analysis," Gorder said. "Finding this method requires a great deal of work and testing."

Gorder said scientists use EPA-approved methods for collecting and analyzing groundwater and soil, so it makes sense to have an approved method for analyzing fruit and vegetables.

Reliability refers to the accuracy of the method. To test method reliability, samples grown in controlled conditions will be irrigated with water of varying concentrations of trichloroethene (TCE)—

some at 10 parts per billion and some at 1,000 parts per billion. The samples will be analyzed and compared to see which method most accurately measures the amount of TCE.

Repeatability is also important because it determines whether or not an analysis method consistently returns the same result. If a method is repeatable, it can then be performed anywhere at any time.

The testing will continue throughout the summer and fall. The Air Force plans to collect fruit samples from selected areas around the base for testing.

Check future issues of EnviroNews for updates on the Edible Plant Study.

## June RAB Meeting

The next meeting of the Hill AFB Restoration Advisory Board will be Thursday, June 27, 2002 from 6:30 p.m. to 8:30 p.m. It will be held at the Courtyard by Marriott hotel in Layton. The primary topic of discussion will be the Fiscal Year 2003 Restoration Budget. If you have any questions about the RAB, please visit our website at [www.em.hill.af.mil](http://www.em.hill.af.mil), then click on the *Restoration* button and then on *Advisory Board*, or call Charles Freeman at (801) 775-6951.

## Hill cleanup information at Weber State University library

All documents related to the environmental cleanup program at Hill AFB are available at the Stewart Library at the Weber State University campus. The documents are all in electronic format and can be viewed, printed or copied to a disk. A searchable index is available to aid in finding specific documents.

## EnviroNews

EnviroNews is a quarterly publication of the Environmental Management Directorate, Hill AFB, Utah, designed to inform the public of hazardous waste cleanup and other environmental activities at Hill AFB.

Contents of EnviroNews are not necessarily the official view of, or endorsed by, the U.S. Government, the Department of Defense, the U.S. Air Force, or its contractors.

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For back issues, visit us on the world wide web.

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**If you have any questions, or would like more information regarding the cleanup work at Hill AFB, please contact one of the people listed here.**

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### Not a wide-spread problem

The discovery of vapors in a few Roy homes is a concern to the Air Force, but it is not something believed to be a problem in other areas.

We have taken numerous indoor air samples in other neighborhoods in and around the areas of contamination, and with a few of exceptions, have not found measurable levels of chemical vapors that could be coming from the groundwater.

### Notification

If an air sample ever shows chemical vapors, we immediately contact the resident and let them know what was found. We then go back and resample the air, to ensure the initial sample was accurate. If the second sample also comes back positive, we then discuss the matter with the resident and determine what actions can or should be taken.

### Standards for indoor air

There are no set standards that specify how much TCE is allowed in indoor air. So the Air Force uses health risk-based calculations set by the EPA to determine how much TCE could be a health risk. If TCE is detected at levels that would increase a person's chance of getting cancer by more than 0.0001 percent, the Air Force will take action to remove the TCE from the home.

## TCE vapors found in Roy homes

After a recent extensive round of air sampling in Roy residences, Hill AFB environmental officials have found levels of chemical vapors that are of concern. The vapors were found in five of 56 homes tested in Roy and efforts have already begun to stop the vapors from entering the homes.

The vapor levels in the five homes do not pose an immediate health threat to residents, said Steve Hicken, Hill's environmental investigations program manager, but the Air Force is working with the homeowners to quickly remedy the problem to eliminate any health risk resulting from long-term exposure.

The vapors are coming from contaminated groundwater that originated from Hill. Contamination was first discovered in Roy about two years ago and the Air Force has been working to define the extent of the contamination. Computer estimates of groundwater movement, called models, suggest the chemicals that caused the contamination were dumped 30 to 40 years ago. Once the chemicals reached the groundwater, they slowly moved west, reaching the area of the air sampling five to 10 years ago.

### What's in the air?

The chemical found in the air is trichloroethene, or TCE. This is a degreasing solvent commonly used at Hill and other industrial operations into the 1970s and is the most common groundwater contaminant in several local cities, including Roy. TCE is suspected to cause cancer. Because past studies about the effects of TCE have been inconclusive, scientists are continuing to study its long-term health effects in people.

The homes with the TCE detections are in an area of

Roy where a unique set of conditions exist that make it particularly easy for TCE vapors to enter a home through cracks or gaps in the foundation.

"In this area of Roy (see map) there are relatively high concentrations of TCE at the top of the water table and the water table is less than 10 feet from the ground surface," Hicken said.

TCE is similar to chemicals used in dry cleaning. The vapors are neither flammable nor explosive. "The vapor levels we have detected in these Roy homes are still very low," Hicken said. "At the levels we have found, TCE will not make you sick or dizzy. In fact, you wouldn't even be able to smell TCE in the air even at concentrations 1,000 times higher than we've found."

"Just because you can't see it or smell it doesn't mean it should be ignored," he said. "That's why we're trying to track this down and eliminate any opportunities for exposure."

### Taking action

To prevent additional exposure, Hicken said, the base is taking immediate action to prevent vapors from entering the homes. "Each of these methods has been used successfully around the country in homes where chemical vapors were entering homes," he said.

One method is to seal the basement floor. Sealing up cracks and gaps should prevent vapors from entering the home, Hicken said. Once sealed, air sampling is repeated to ensure the sealant's effectiveness. If the sealing is successful, no further action is needed.

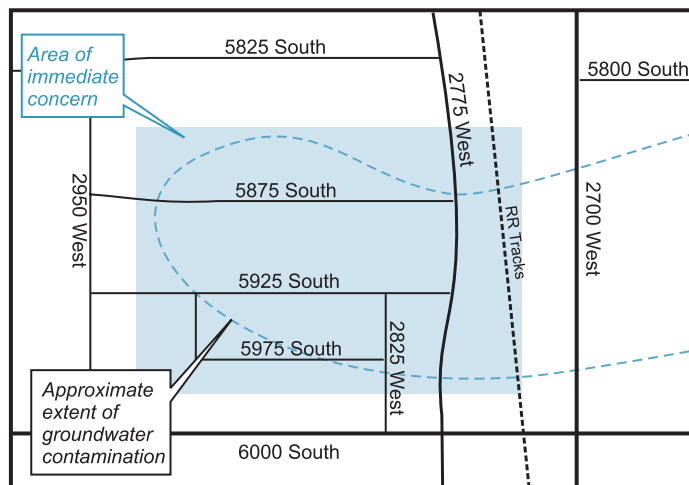
Another approach is to install a vacuum system along the bottom of the foundation to draw the vapors away

from the home before they can enter. While this system has proven to be effective in many areas across the country, it requires some minor modifications to the home.

Any actions taken by the Air Force will be done at no cost to the homeowner.

Hicken said there are still a lot of unanswered questions. "There's still much to learn about what is happening and why. We are talking to people in other parts of the country to find out what has and hasn't worked."

Hicken said results of this approach have



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# Back to work!

## Spring ushers in new field season

Hill AFB contractors are back to work conducting investigations and collecting samples as a new field season begins.

The field season lasts from April through October and is when most of the field work occurs. This includes drilling wells, taking direct-push groundwater samples, construction of cleanup systems and other work that is dependent on the weather.

The following is a round-up of what field work is planned for 2002 in each of the communities surrounding Hill AFB.

This schedule may change as new requirements and data become available.

If our contractors are working near your home, we ask for your patience, as sometimes the drill rigs or other machinery we use can be noisy. Please keep your children away from the construction site and use caution when driving or parking near construction sites. If you notice anything that concerns you, please call the person listed on the notification card you received on your door, or call Charles Freeman at 775-6951.

## 2002 Field Work Schedule

	Location	Activity	Dates	What to expect
Roy	1900 W to 2325 W from 5800 S to 6000 S	Installing monitoring wells using an auger rig.	October	Can be loud. Rigs will need a lot of space in the streets to work.
	3000 W at 5875 W	Direct push sampling	March through June (possibly all year)	Large trucks in the streets. May need to move vehicles away from sampling locations.
	2200 W to 3000 W from 5825 S to 6000 S	Installing small-diameter monitoring wells	March through September	Small to med.-sized truck in streets. Avoid driving over newly completed wells. (They will be coned off) Will notify residents prior to starting work.
Clinton	1100 W to 2000 W at 2600 N to 2550 N	Installing small-diameter monitoring wells.	March through September	Small to med.-sized truck in streets. Avoid driving over newly completed wells. (They will be coned off)
S. Weber	Canyon Meadows subdivision	Installing two monitoring wells.	Summer	Drill rig in the area. Should not interfere with traffic or cause excessive noise.
	North Interception Trench (800 E and South Weber Drive.)	Upgrade existing groundwater collection system.	Summer	Not in a populated area. Should cause no disruption.
Riverdale	Craigdale subdivision	System piping modifications.	Fall or Winter	Some equipment. Should not interfere with traffic or cause excessive noise.

### What is field work?

Much of environmental work is investigation. To learn about what is in the groundwater and soil, we must take samples and have those samples analyzed. The Air Force hires civilian contractors to conduct this sampling. This sampling occurs in city streets, parks and other monitoring points we have established around the base. Other field work includes constructing and maintaining cleanup systems.

### Cities are aware

Before any new monitoring point is established—such as a monitoring well or another type of testing point, we clear that location with the city involved. We try very hard to be sure the cities are aware of what we are doing and where we are doing it.

### Public notification

We do our best to notify the local residents when we will be working with heavy equipment in their neighborhood. This is done with blue door hanger cards that announce the approximate dates of the work and the name and phone number of someone to call with questions. We usually do not give advance notification for routine sampling of monitoring wells.

**Official Business**



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Find out more about Hill AFB's environmental programs by logging on to

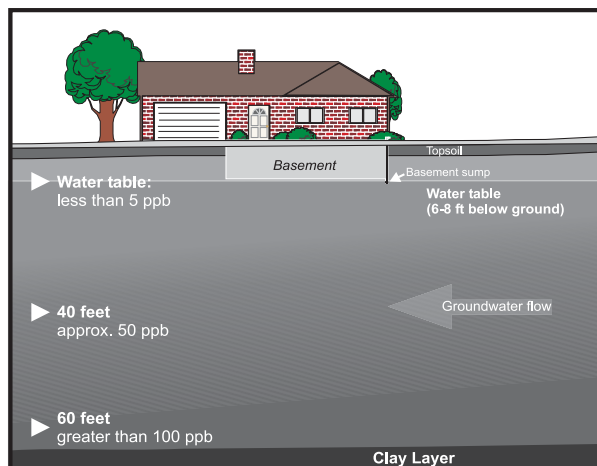
[www.em.hill.af.mil](http://www.em.hill.af.mil)

## TCE vapors

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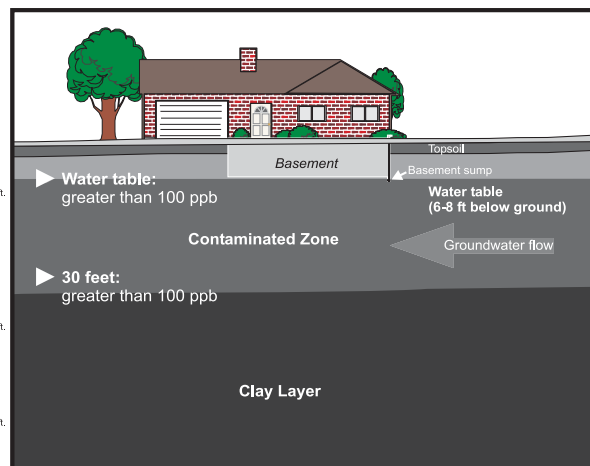
been positive. The basement in one of the five homes has already been sealed and re-sampling showed no chemical vapors. He said Hill plans to re-sample all 55 homes in late fall or early winter.

“We want to make sure we understand what is going on, so we need more data to work with,” Hicken said. “We caused this problem and we want to fix it.”



### Typical groundwater conditions

In most areas where we have found groundwater contamination, the highest concentrations of chemicals are deeper in the shallow aquifer. There is often a layer of clean or nearly clean water at the top of the water table. In situations like this, measurable quantities of chemical vapors are not likely to enter the basements.



### In the Roy area of concern

In one area in Roy (the shaded area on the map), the chemicals are distributed equally throughout the shallow aquifer. This puts relatively high concentrations of contaminants right at the top of the water table—in some cases, at basement level. This is why we have found chemical vapors in a few homes.

## Chemical concentrations

The level of chemicals found in the groundwater and in the air are measured in parts per billion. One part per billion is equal to 0.0000001%. TCE concentrations in the groundwater in the area of concern are at or near 100 parts per billion. In the four homes where TCE vapors have been found, concentrations have ranged from 3 to 18 parts per billion.

## Not in drinking water

The TCE contamination has not affected drinking water supplies. The drinking water comes from different sources and is tested regularly for contaminants like TCE.